



PRIORITIZATION OF PROMINENT ROAD-RAIL CONFLICTS

Advisory Panel Meeting

August 2, 2016

MEETING AGENDA

- Introductions
- Project Update
- Database Overview
- Screening & Prioritization Process
- Next Steps



LEGISLATIVE DIRECTION

2ESHB 1299, Section 204(3)

(3) \$250,000 of the motor vehicle account—state appropriation, from the cities' statewide fuel tax distributions under RCW 46.68.110(2), is for a study to be conducted in 2016 to identify prominent road-rail conflicts, recommend a corridor-based prioritization process for addressing the impacts of projected increases in rail traffic, and identify areas of state public policy interest, such as the critical role of freight movement to the Washington economy and the state's competitiveness in world trade.

PROJECT OBJECTIVES

- Understand Current and Future Mobility, Community Impacts, and Safety Problems
- Understand and Apply State, Local, and Private Policy Interests
- Develop a Criteria-Based Prioritization Process



WHO IS INVOLVED?

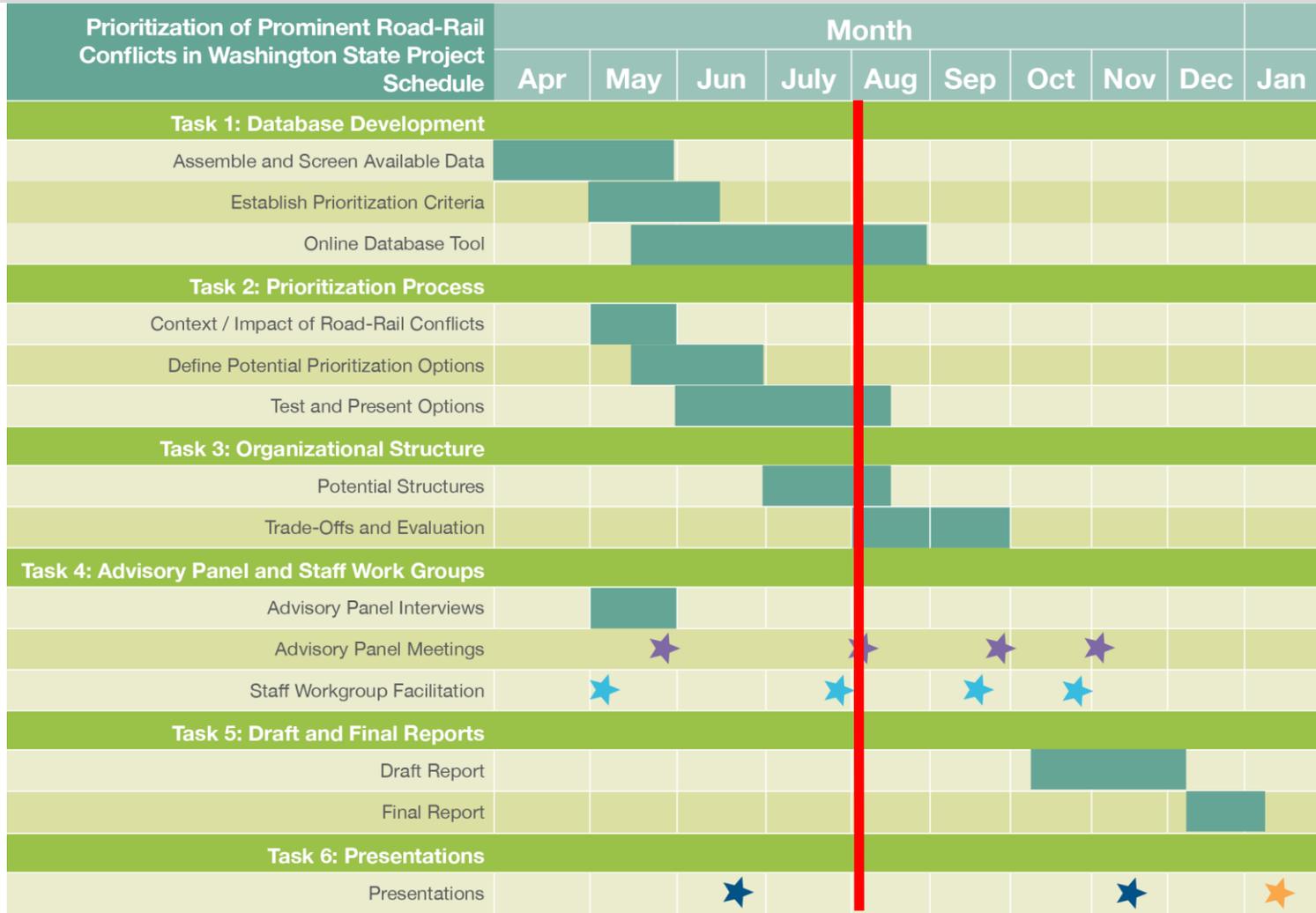
ADVISORY PANEL

1. Paul Roberts, City of Everett, AWC
2. Sean Guard, City of Washougal, AWC
3. Lisa Janicki, Skagit County, WSAC
4. Al French, Spokane County, WSAC
5. Kevin Murphy, Skagit COG
6. Ashley Probart, FMSIB
7. Dave Danner, UTC
8. James Thompson, WPPA
9. Ron Pate, WSDOT
10. Johan Hellman, BNSF
11. Sheri Call, Washington Trucking Association

STAFF WORK GROUP

1. Beth Redfield, JTC, Project Manager
2. Mary Fleckenstein, JTC
3. Dave Catterson, AWC
4. Gary Rowe, WSAC
5. Jason Lewis, UTC
6. Lauren McCloy, UTC
7. Sean Ardussi, PSRC
8. Elizabeth Robbins, WSDOT Planning
9. David Biering, WSDOT
10. Kyle McKeon, WSDOT
11. Faris Al-Memar, WSDOT Planning
12. Chris Herman, WPPA
13. Steven Ogle, Ecology
14. Hayley Gamble, STC
15. Paul Ingiosi, HTC
16. Kathy Cody, OFM
17. Jackson Maynard, SRC
18. Sharon Swanson, SDC
19. Debbie Driver, HDC
20. Dana Quam, HRC

SCHEDULE



★ Advisory Panel Meeting

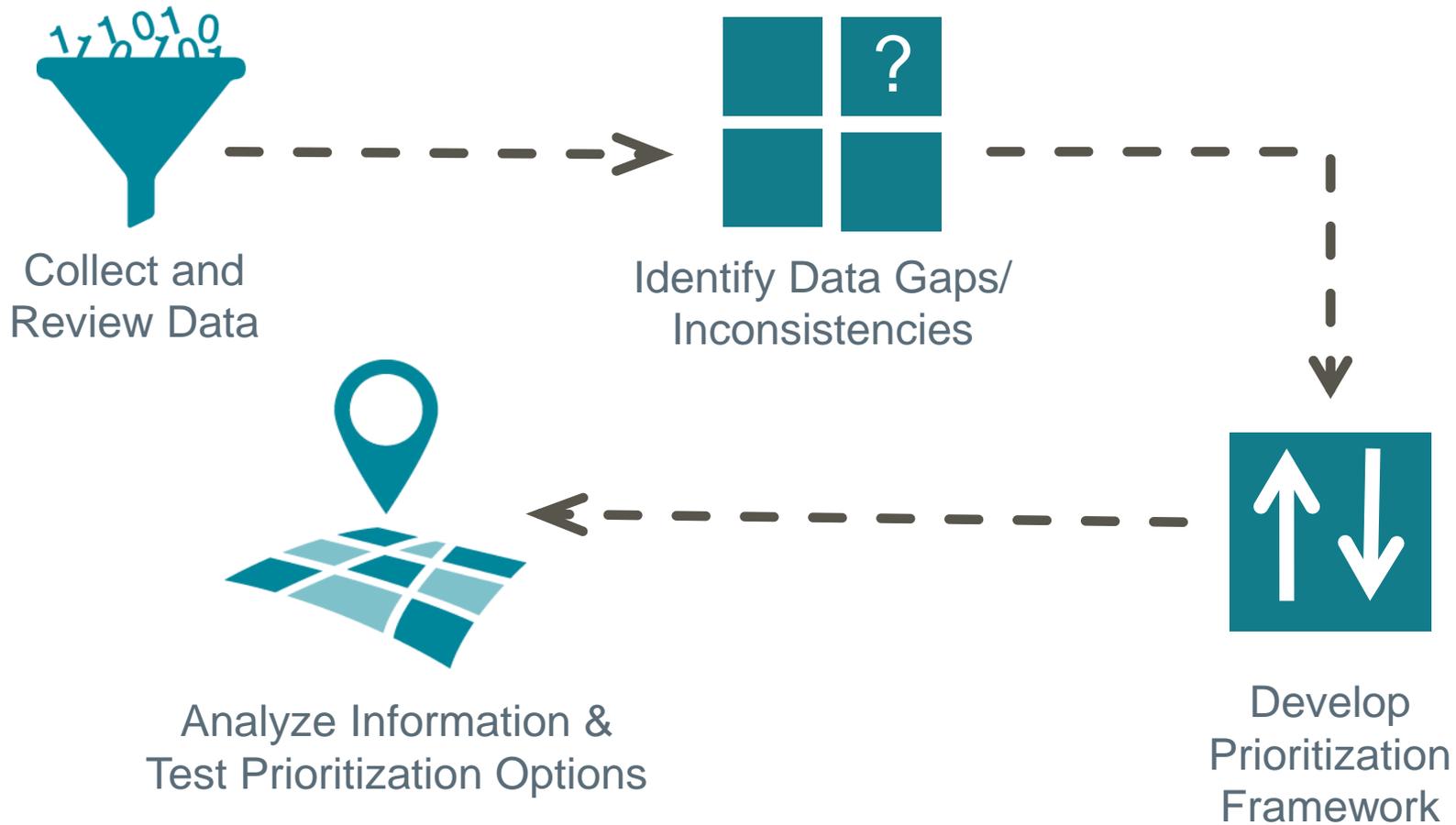
★ Staff Workgroup

★ Presentation

★ Presentation During 2017 Legislative Session

WE ARE HERE

WORK PROGRAM APPROACH



DATABASE OVERVIEW

- Data Overview
- Data Gaps and How They Were Addressed

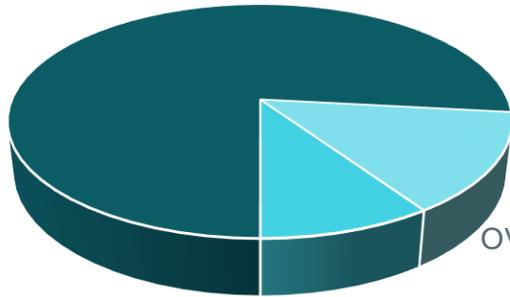
DATA OVERVIEW

● **ACTIVE CROSSINGS: 2,863**

● **OTHER CROSSINGS: 1,308**

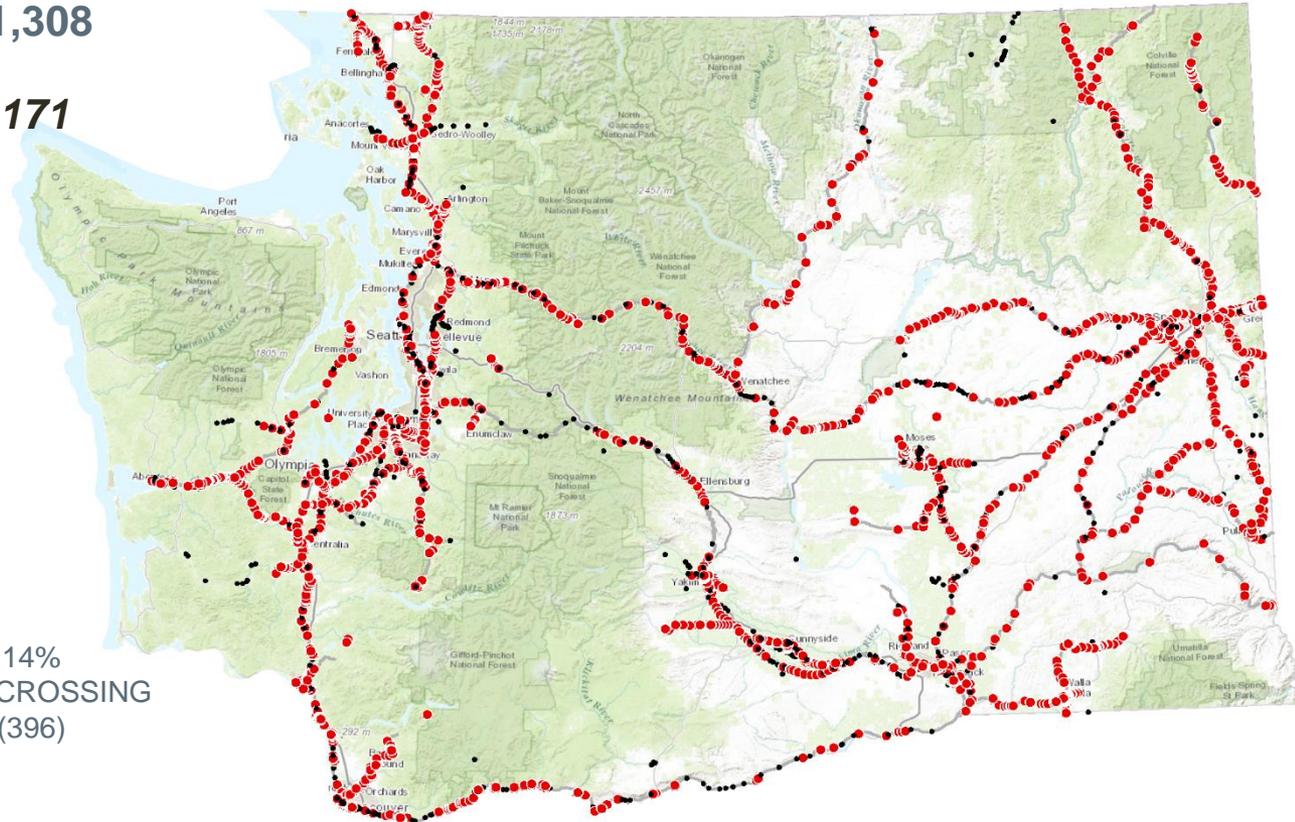
TOTAL CROSSINGS 4,171

76%
AT-GRADE
(2,197)



14%
OVERCROSSING
(396)

10%
UNDERCROSSING
(270)



DATA OVERVIEW

PROJECT CROSSINGS: 2,197

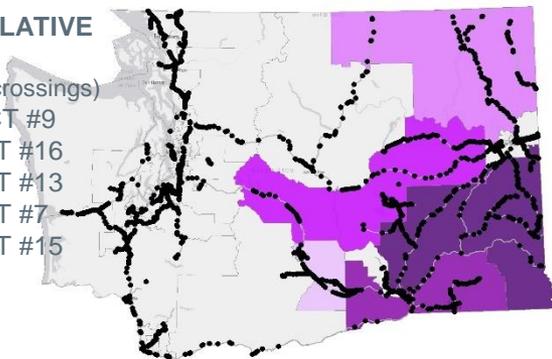
Sites were chosen that met the following characteristics:

- **Active** rail line
- **Publicly** accessible
- **At-grade** crossing

TOP 5 LEGISLATIVE DISTRICTS

(by number of crossings)

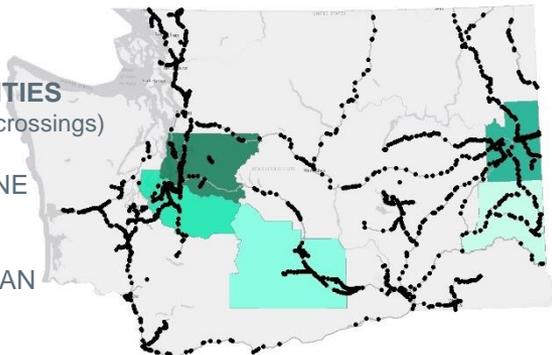
- 10% DISTRICT #9
- 9% DISTRICT #16
- 9% DISTRICT #13
- 6% DISTRICT #7
- 6% DISTRICT #15



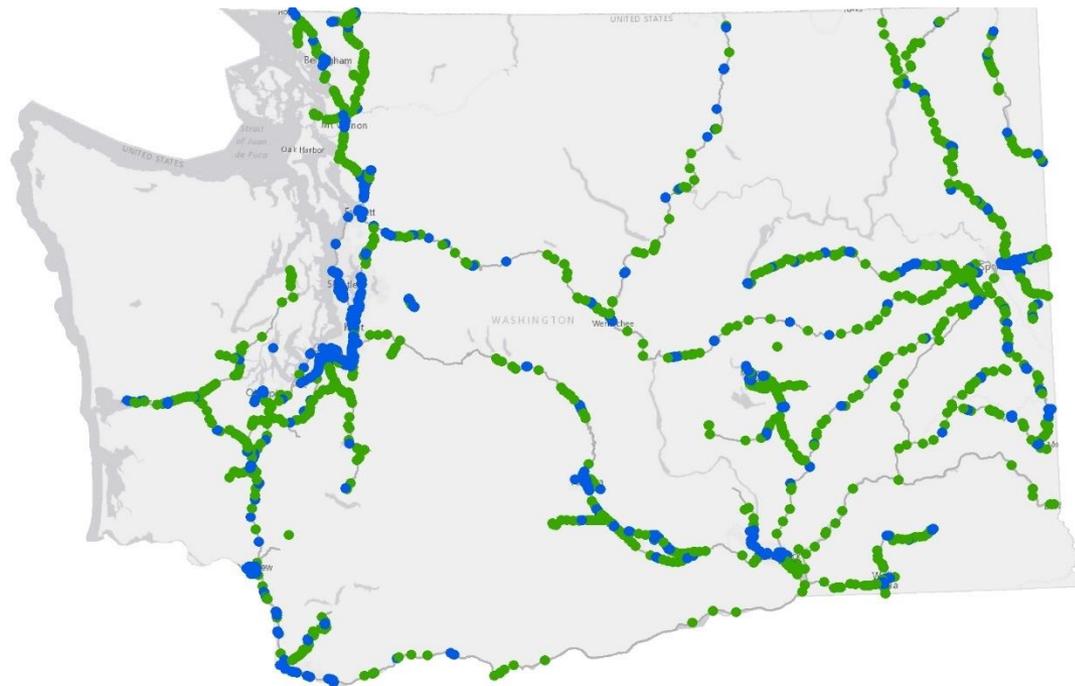
TOP 5 COUNTIES

(by number of crossings)

- 11% KING
- 10% SPOKANE
- 8% PIERCE
- 8% YAKIMA
- 6% WHITMAN



- **URBAN vs RURAL**
(by number of crossings)
- 54% URBAN
- 46% RURAL



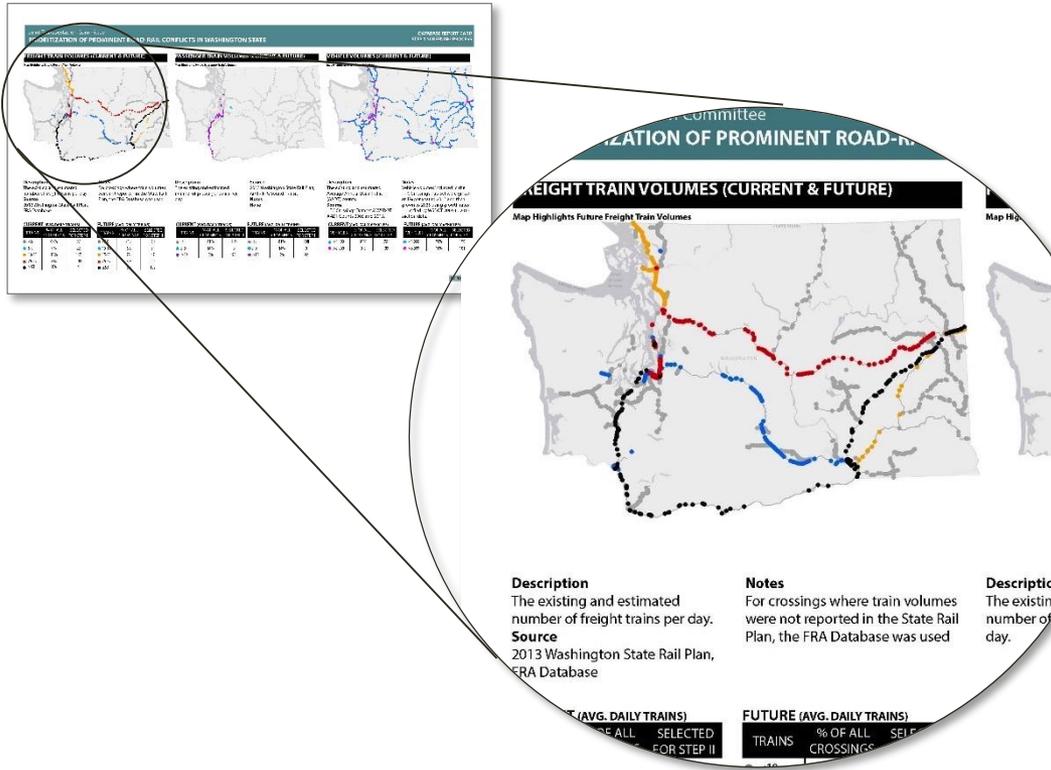
TOP 5 RTPOs (by number of crossings)

- 23% PSRC
- 12% QUAD-COUNTY
- 10% SPOKANE
- 9% SW WASHINGTON
- 8% YAKIMA VALLEY

TOP 5 MPOs (by number of crossings)

- 43% NO AFFILIATION
- 23% PSRC
- 10% SPOKANE
- 4% WHATCOM
- 4% BENTON-FRANKLIN

DATA GAPS – HOW THEY WERE ADDRESSED



Freight Train Counts

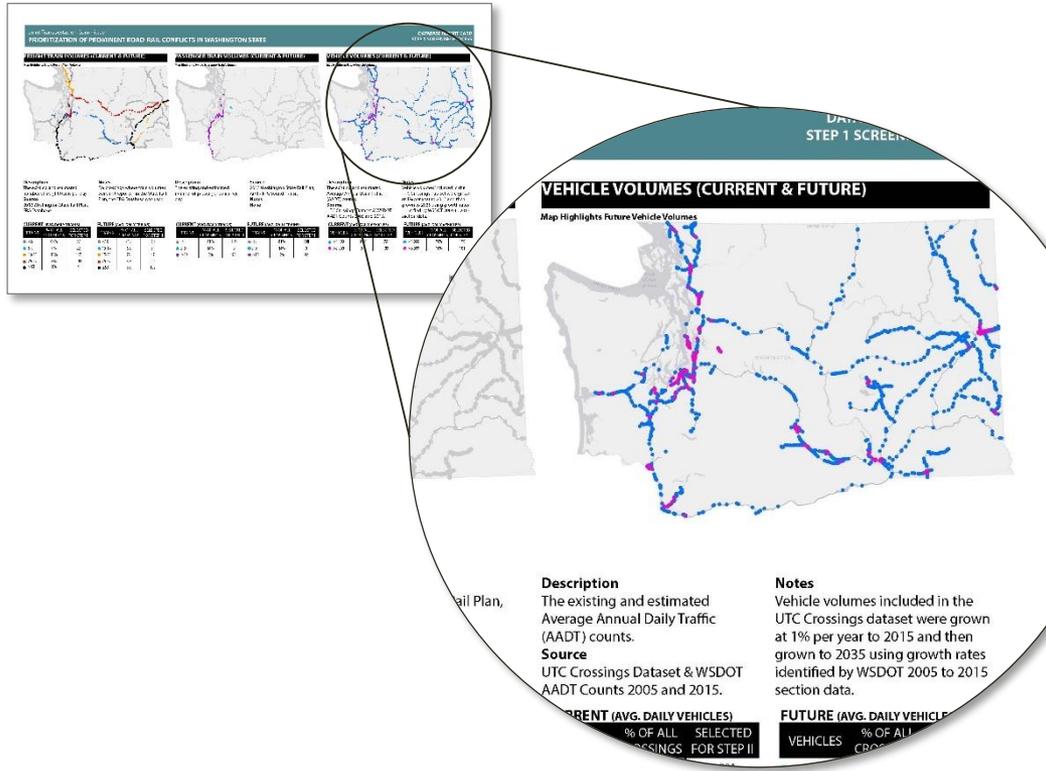
ISSUE

- *The Washington State Rail Plan only had data for some at-grade crossings*
- *The FRA database has inconsistent or outdated data*

SOLUTION

- *The Rail Plan was used to populate train data where available*
- *Where unavailable, the FRA database was used*
- *Results in best possible data that is currently available*

DATA GAPS – HOW THEY WERE ADDRESSED



Vehicle Counts

ISSUE

- Existing data is inconsistent
- Future data is nonexistent

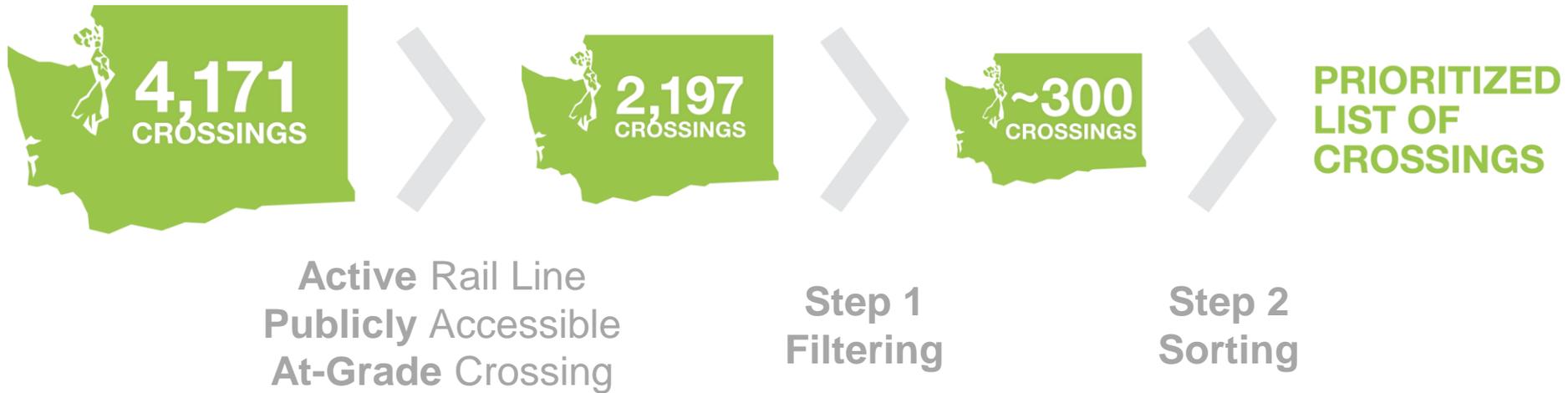
SOLUTION

- Grow existing vehicle counts to common year (2015)
- Assume 2015 where data on year of count was not available
- Use regional historic trends (2005-2015) to grow data to future year (2035)

SCREENING & PRIORITIZATION PROCESS

➤ Overview of Process

OVERVIEW OF THE PRIORITIZATION PROCESS



OVERVIEW OF THE PRIORITIZATION PROCESS

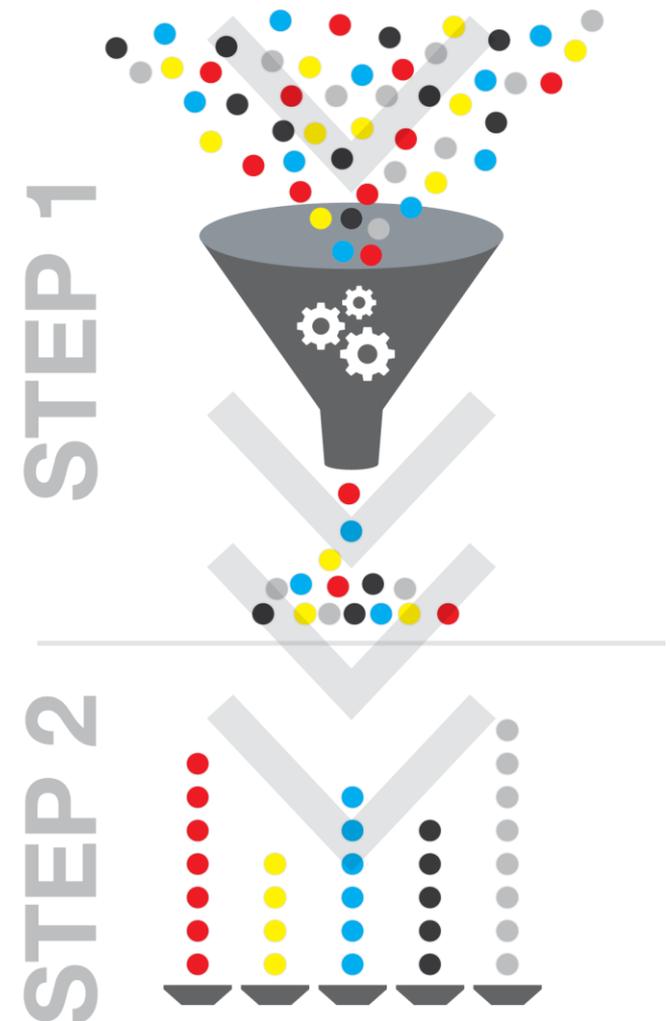
A **Two-Step Process** is being used to **filter and sort** crossings

STEP 1 (Filtering)

- All inclusive
- Less detailed assessment
- Intent is to not miss any important crossings
- Collect a candidate list of prominent crossings for further detailed evaluation

STEP 2 (Sorting)

- More detailed evaluation
- Collect and compile more specific data
- Compare and contrast
- Prioritize the most prominent crossings



OVERVIEW OF THE PRIORITIZATION PROCESS

Crossings are evaluated using three common criteria:



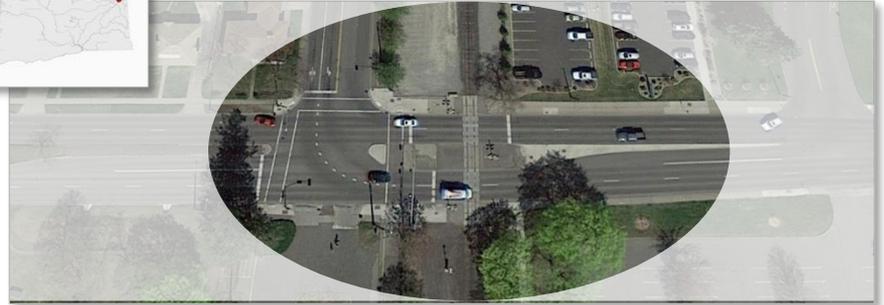
- Common criteria that represent shared values in transportation. They are the Top Criteria for:
 - Freight Mobility Strategic Investment Board
 - Transportation Improvement Board
 - California Public Utilities Commission for Rail Crossings Prioritization
 - FHWA Railroad-Highway Grade Crossing Handbook
 - USDOT TIGER Program
- Embody many sub-criteria, using quantifiable metrics
- Discrete topics and little overlap of sub-criteria
- Able to weight criteria based on community or agency priorities and needs
- Able to summarize impacts or needs by criteria

QUESTIONS ON STEP I METHODOLOGY

- What do we need to make sure we capture when identifying the most prominent crossings for prioritizing in Step 2?
- What is the most important problem for your region or in your area of expertise?
- We are suggesting that the most prominent crossings can be identified by reviewing easily available data that indicates a likelihood of having mobility, community, and safety problems – Does this approach make sense?

STEP 1 METHODOLOGY

What data do we use to filter the crossings?



- ALTERNATE GRADE SEPARATED CROSSINGS
- # OF MAINLINE TRACKS



- RAIL CLASSIFICATION
- VEHICLE VOLUMES (2015 & 2035)
- FREIGHT TRAIN COUNT (2015 & 2035)
- PASSENGER TRAIN COUNT (2015 & 2035)
- PRESENCE OF UNIT TRAINS



- PREVIOUSLY IDENTIFIED PROJECT BY RTP/MPO
- ROAD FUNCTIONAL CLASSIFICATION

STEP 1 METHODOLOGY

How Crossings Were Filtered for the Safety, Mobility, and Community Categories

Step 1 Criteria	Range	Scoring	Proposed Weight
SAFETY CRITERIA			
Presence of Alternate Grade Separated Crossing within ½ mile	Yes, No	Yes=1; No=2	1.5
# of Mainline Tracks	1 or less; 2 or more	Less than=1, More than=2	1.5
MOBILITY CRITERIA			
Railroad Classification	Class I; Class III	Class I=2; Class III=1	1
Vehicle Volumes (2015)	Less than/equal to 8,000; 8,001+	Less than=1, More than=2	1.5
Vehicle Volumes (2035)	Less than/equal to 8000, 8,001+	Less than=1, More than=2	1.5
Freight Train Count (2015)	Less than 10, 10 or more	Less than=1, More than=2	1.5
Freight Train Count (2035)	Less than 15, 15 or more	Less than=1, More than=2	1.5
Passenger Train Count (2015)	Less than 10, 10 or more	Less than=1, More than=2	1
Passenger Train Count (2035)	Less than 10, 10 or more	Less than=1, More than=2	1
Presence of Unit Trains	Yes, No	Yes=2; No=1	1
COMMUNITY CRITERIA			
Roadway Classification	Major Collector and above; Minor Collector and below	Major Collector and above=2; Minor Collector and below=1	1
Previously Identified Project by RTPO/MPO	Yes, No	Yes=2; No=1	1

Does the weighting scheme make sense?

STEP 1 METHODOLOGY

How crossings were selected for mobility, safety, community, and higher aggregate categories

1. SELECT CATEGORIES

The top ~50 highest scoring crossings in each category are selected.

Crossings that were selected in a previous category are removed from consideration for the others.

#1 MOBILITY



#2 SAFETY



#3 COMMUNITY



2. SELECT REMAINING

Select additional ~150 crossings with remaining higher aggregate score.

Crossings that were previously selected in any of the categories are removed from consideration.

MOBILITY SCORE

+

COMMUNITY SCORE

+

SAFETY SCORE

||

AGGREGATE SCORE

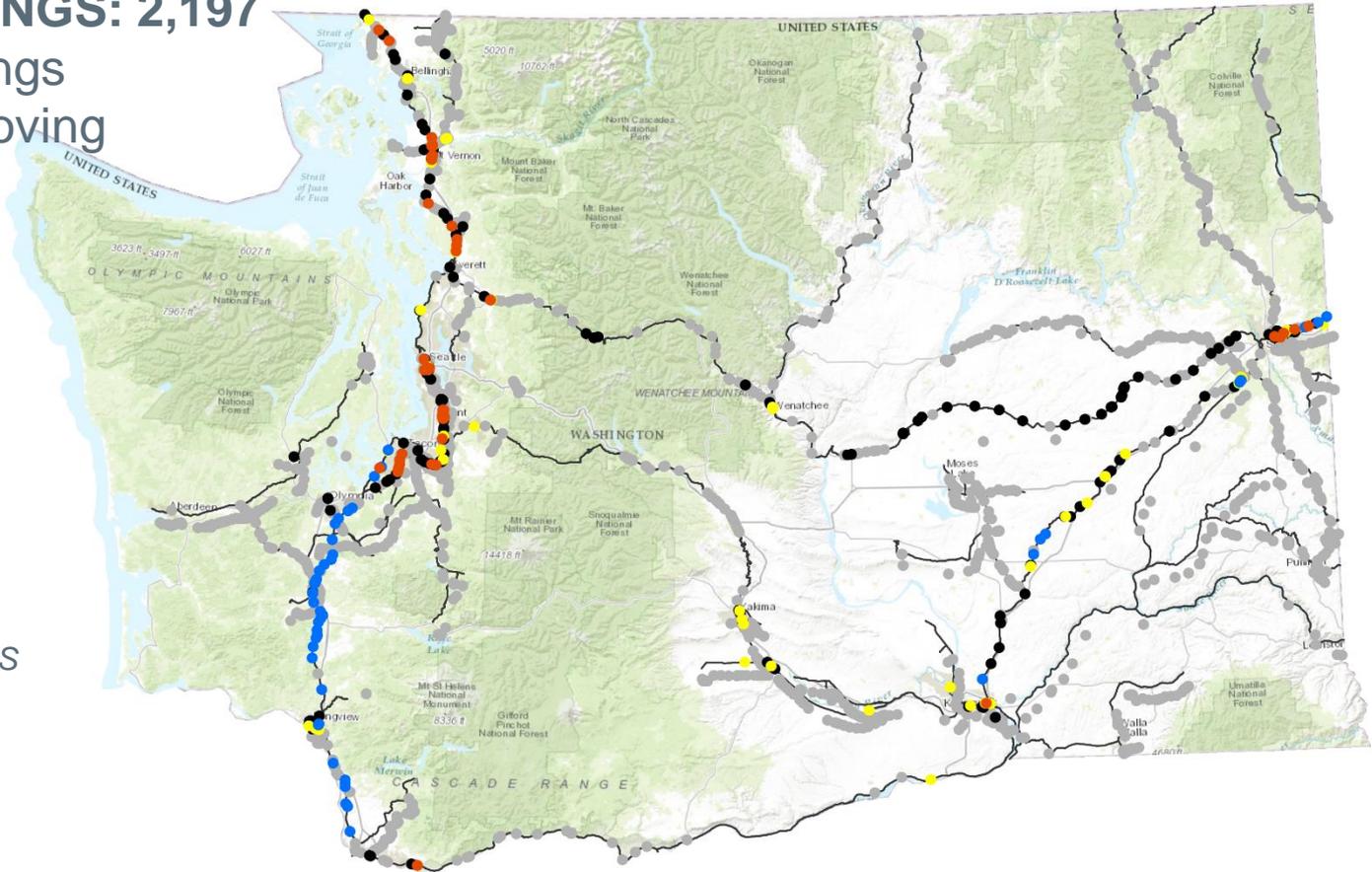


STEP 1 RESULTS

PROJECT CROSSINGS: 2,197

300 selected crossings indicated in color moving to Step 2

- *CROSSINGS NOT SELECTED FOR STEP II PRIORITIZATION*
- *MOBILITY CROSSINGS*
- *SAFETY CROSSINGS*
- *COMMUNITY CROSSINGS*
- *REMAINING HIGH AGGREGATE SCORE CROSSINGS*



Note: Crossings that move to Step 2 under a particular category could also be higher scoring under other categories (i.e. a crossing with mobility concerns could also have safety concerns). This is because crossings that were selected for Step 2 in a previous category were removed from consideration in other categories to avoid duplication.

STEP 1 RESULTS - SAFETY CRITERIA

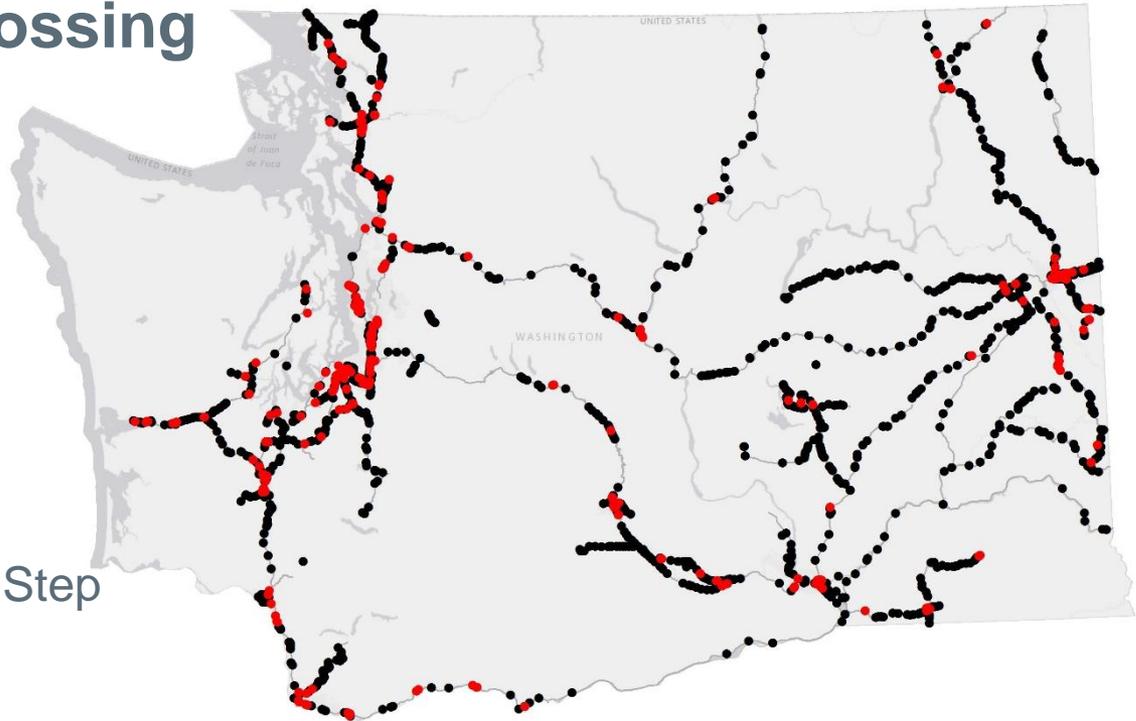
Presence of Alternate Grade-Separated Crossing within a Half Mile

Identifies potential impacts to emergency vehicle access if a crossing is closed due to train activity

Takeaway:

- Similar make-up of Step 2 crossings compared to all Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



Presence of Alternate Grade Separated Crossing	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● None	1,684 (77%)	237 (79%)
● 1 or more	513 (23%)	63 (21%)

STEP 1 RESULTS - SAFETY CRITERIA

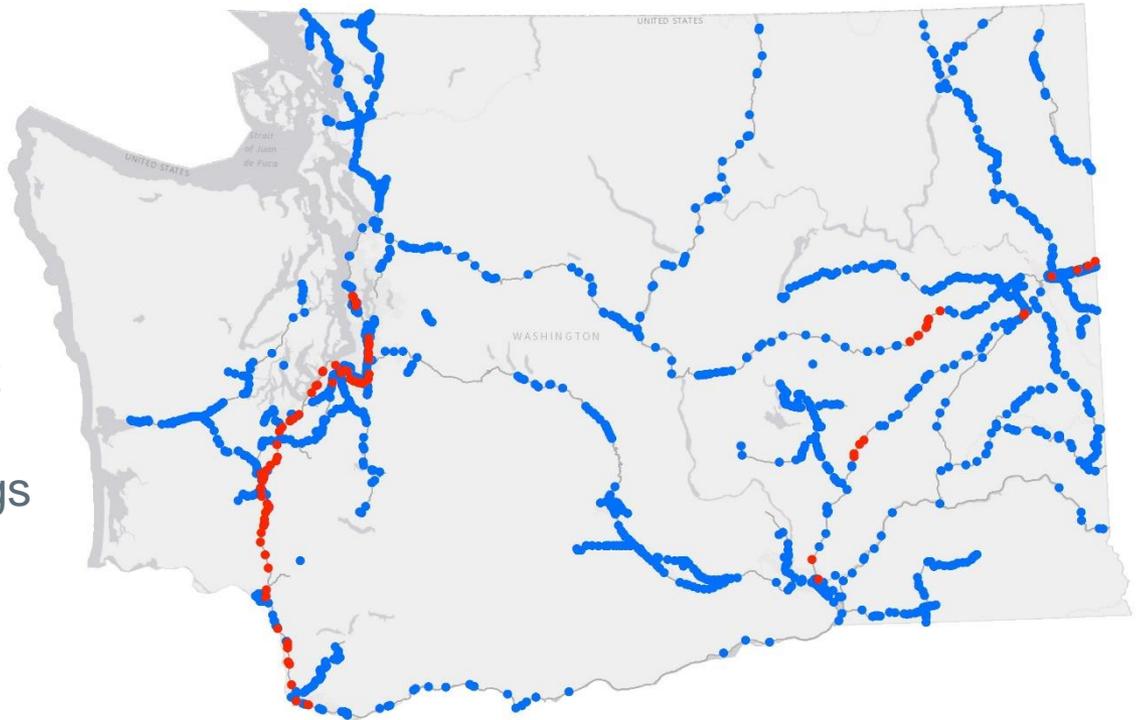
Number of Mainline Tracks

More tracks could lead to more potential conflicts

Takeaway:

- Much higher proportion of Step 2 crossings that have 2 or more mainline tracks compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



Number of Mainline Tracks	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● 1 or less	2,082 (95%)	194 (65%)
● 2 or more	115 (5%)	106 (35%)

STEP 1 RESULTS - MOBILITY CRITERIA

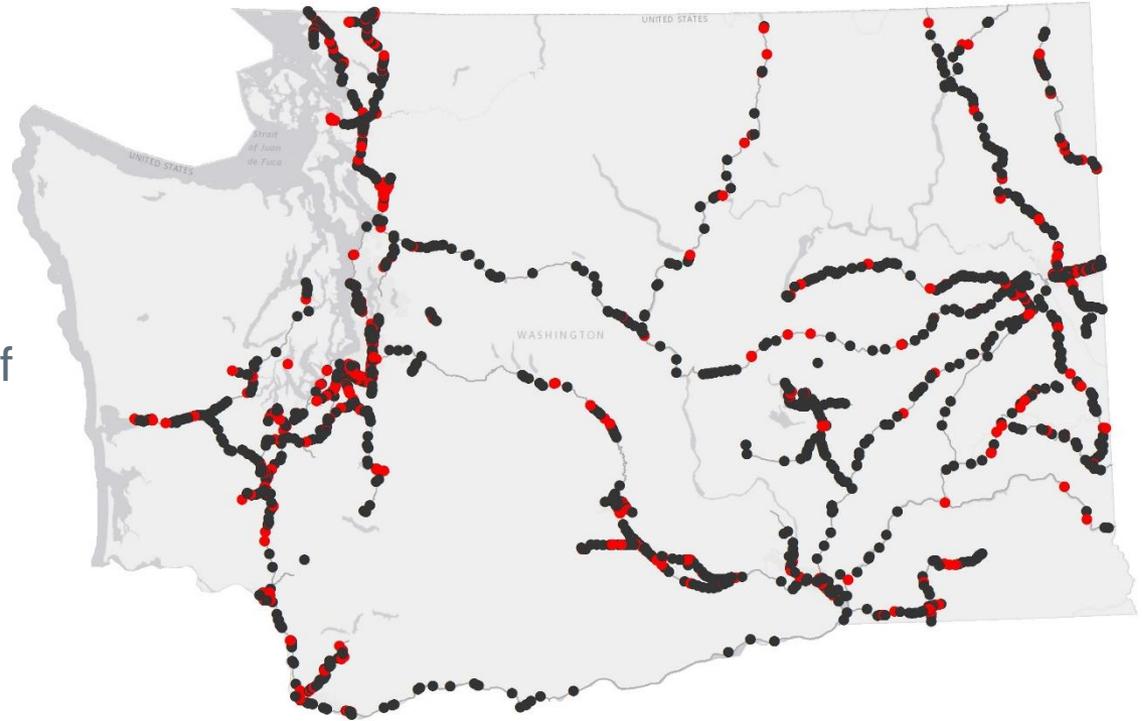
Rail Classification

Class I rail lines typically carry higher volumes of trains than Class III rail lines

Takeaway:

- Much higher proportion of Step 2 crossings that are on Class I rail lines compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



Rail Classification	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
 Class I	1,046 (48%)	275 (75%)
 Class III	1,151 (52%)	25 (25%)

STEP 1 RESULTS - MOBILITY CRITERIA

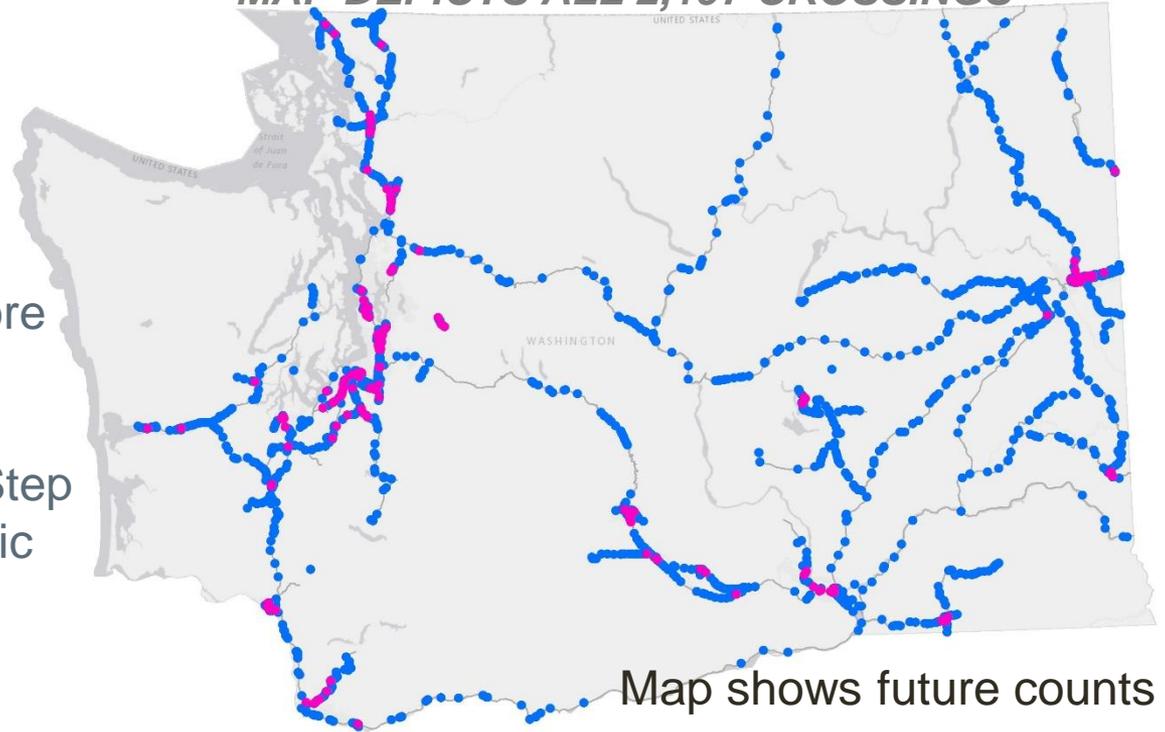
Vehicle Counts

Average daily traffic count in 2015 and 2035

Takeaways:

- Higher traffic counts are more concentrated in higher population areas.
- Much higher proportion of Step 2 crossings with higher traffic counts compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



Map shows future counts

CURRENT (avg. daily vehicles)

FUTURE (avg. daily vehicles)

CURRENT (avg. daily vehicles)			FUTURE (avg. daily vehicles)		
Vehicles	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)	Vehicles	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● ≤ 8,000 vehicles	2,005 (91%)	201 (67%)	● ≤ 8,000 vehicles	2,002 (91%)	199 (67%)
● > 8,000 vehicles	192 (9%)	99 (33%)	● > 8,000 vehicles	195 (9%)	101 (33%)

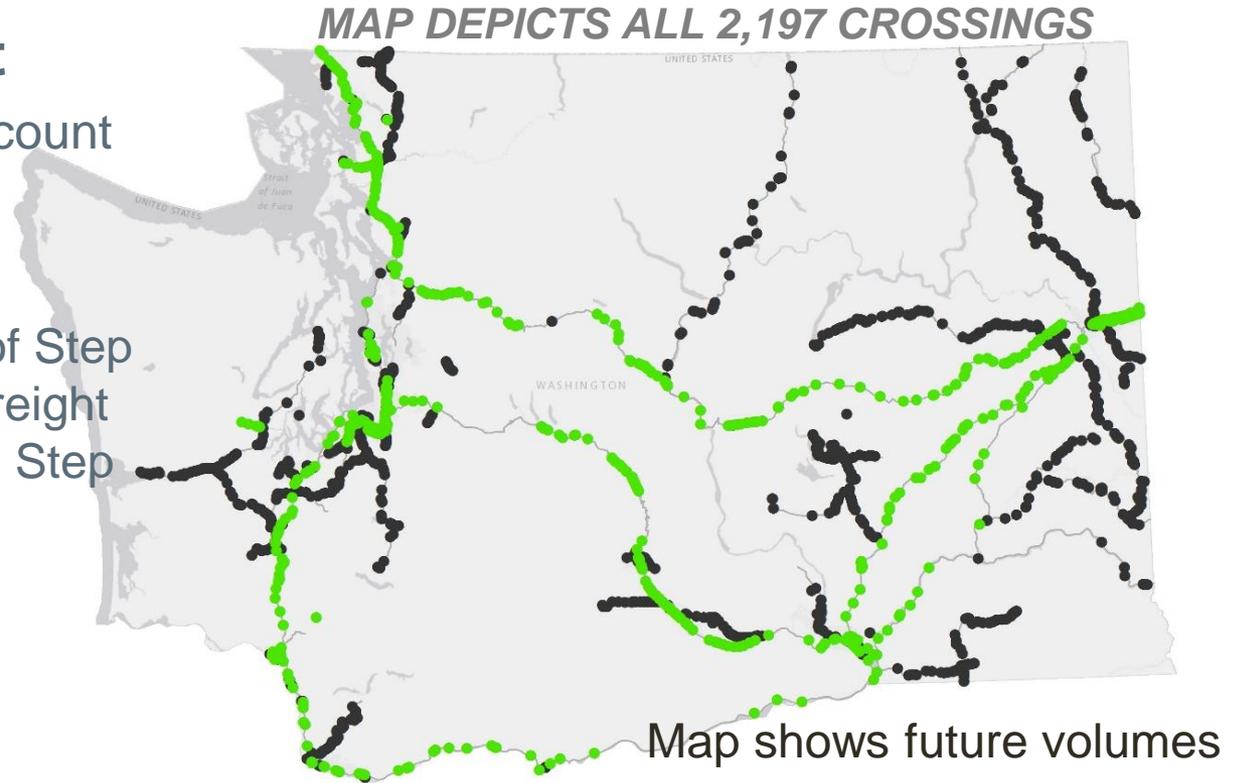
STEP 1 RESULTS - MOBILITY CRITERIA

Freight Train Count

Average daily freight train count in 2015 and 2035

Takeaway:

- Much higher proportion of Step 2 crossings with higher freight train counts compared to Step 1 crossings



CURRENT (avg. daily trains)			FUTURE (avg. daily trains)		
Trains	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)	Trains	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● < 10 trains	1,681 (77%)	49 (16%)	● < 15 trains	1,688 (77%)	61 (20%)
● ≥ 10 trains	516 (23%)	251 (84%)	● ≥ 15 trains	509 (23%)	239 (80%)

STEP 1 RESULTS - MOBILITY CRITERIA

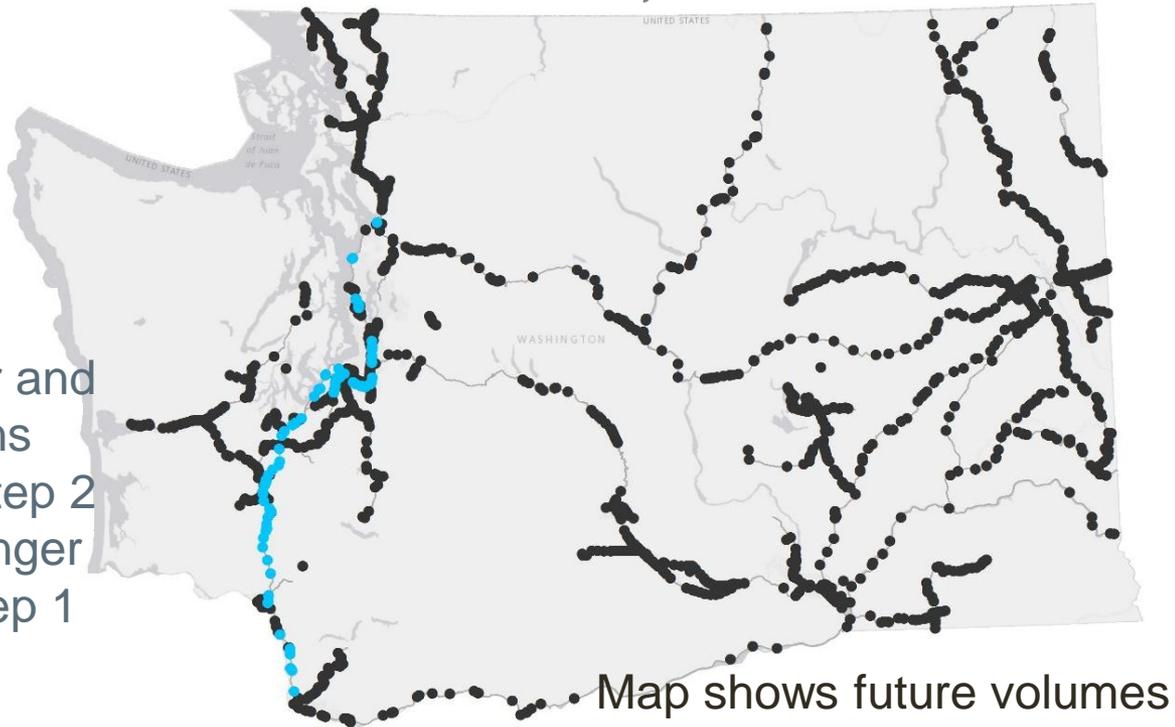
Passenger Train Counts

Average daily passenger train count in 2015 and 2035

Takeaways:

- Passenger trains are shorter and move faster than freight trains
- Much higher proportion of Step 2 crossings with higher passenger train counts compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



CURRENT (avg. daily trains)			FUTURE (avg. daily trains)		
Trains	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)	Trains	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● < 10 trains	2,095 (95%)	208 (69%)	● < 10 trains	2,095 (95%)	208 (69%)
● ≥ 10 trains	102 (5%)	92 (31%)	● ≥ 10 trains	102 (5%)	92 (31%)

STEP 1 RESULTS - MOBILITY CRITERIA

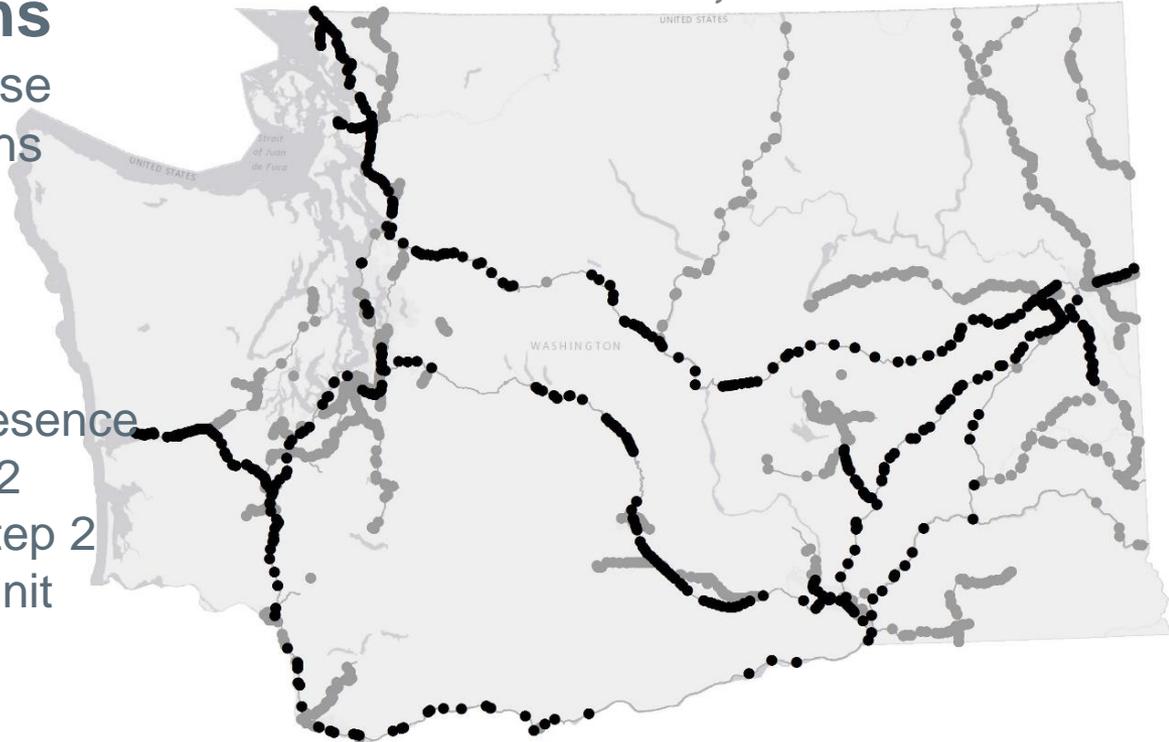
Presence of Unit Trains

Unit train data reflects that these longer and slower-moving trains block vehicle traffic for longer periods of time

Takeaways:

- Not all crossings with the presence of unit trains moved to Step 2
- Much higher proportion of Step 2 crossings with presence of unit trains compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



Trains	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● Present	629 (29%)	230 (77%)
● Absent	1,568 (71%)	70 (23%)

STEP 1 RESULTS - COMMUNITY CRITERIA

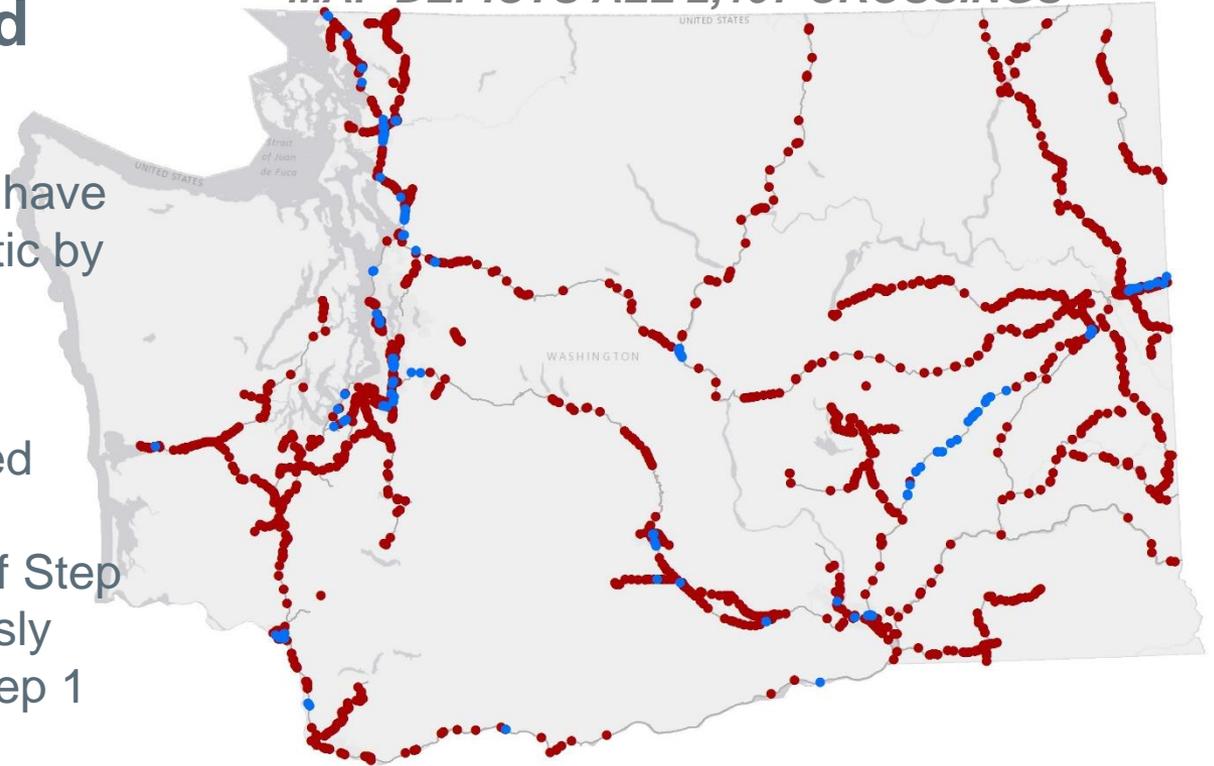
Previously Identified Projects

Measures the locations that have been identified as problematic by MPO's and RTPO's

Takeaways:

- Not all previously identified projects moved to Step 2
- Much higher proportion of Step 2 crossings were previously identified compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS



Identified	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
Yes	146 (7%)	123 (41%)
No	2,051 (93%)	177 (59%)

STEP 1 RESULTS - COMMUNITY CRITERIA

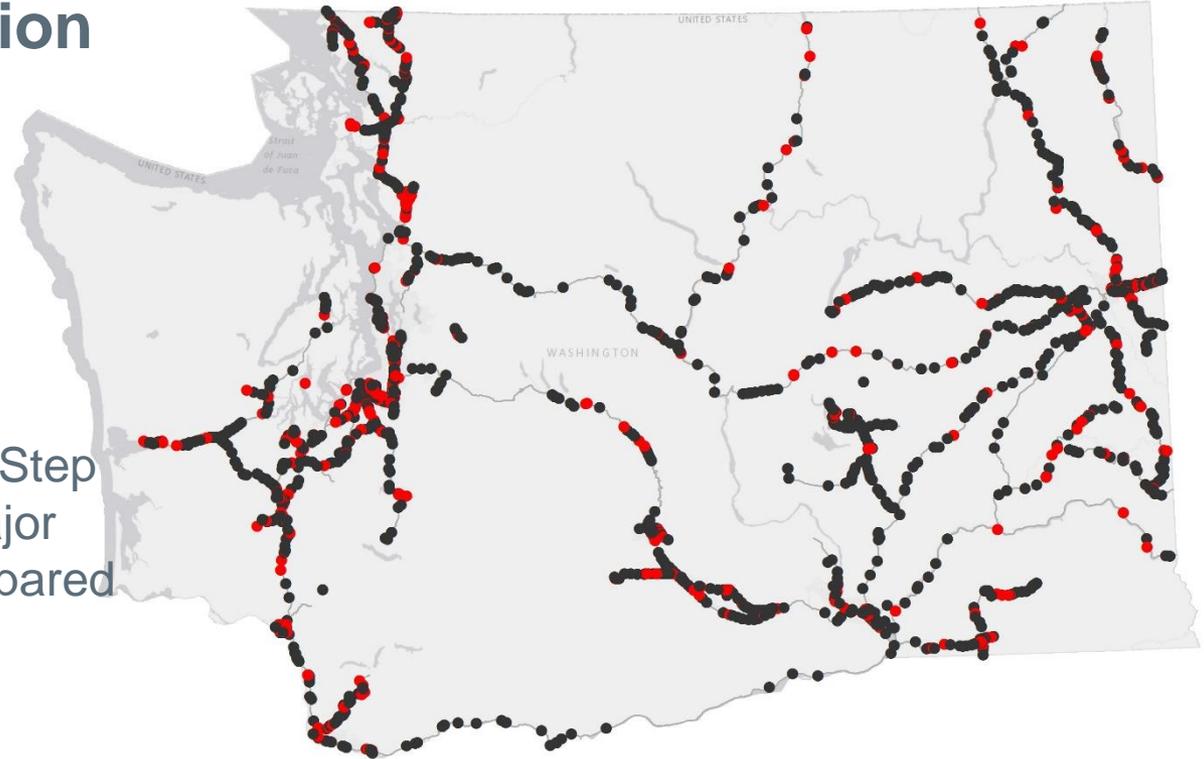
Roadway Classification

Measures the potential impacts to community access by assessing the function of the roadway

Takeaway:

- Much higher proportion of Step 2 crossings that are on Major Collectors and above compared to Step 1 crossings

MAP DEPICTS ALL 2,197 CROSSINGS

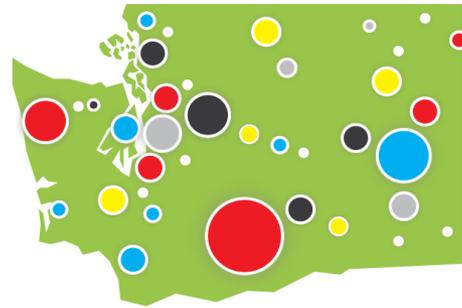


Roadway Classification	% of All Crossings (Total=2,197)	Selected for Step 2 Total number (%)
● Minor Collector and Below	1,496 (68%)	87 (29%)
● Major Collector and Above	701 (32%)	213 (71%)

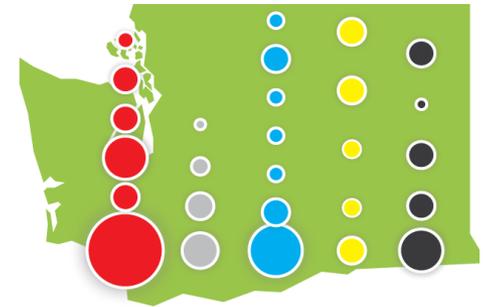
STEP 2 METHODOLOGY



STEP 2



EVALUATION



PRIORITIZATION

STEP 2

- More detailed evaluation
- Collect and compile more specific data
- Compare and contrast
- Prioritize the most prominent crossings

STEP 2 METHODOLOGY



Increase Risks

40pts →

1. Presence of Alternate Grade-Separated Crossings
2. Number of Mainline Tracks
3. Proximity to Emergency Services
4. Collision History

Safety Record

30pts →

Infrastructure Status

30pts →

5. Level of Protection



Freight Demand

10pts →

6. Roadway Freight Classification

People Demand

30pts →

7. Vehicle Counts

Mobility Barrier

60pts →

8. Gate Down Time



Economic

50pts →

9. Employment Density
10. Proximity to Ports/ Intermodal Facilities

Activity Area

20pts →

11. Population Density

Environment

15pts →

12. Environmental Risk

Social Equity

15pts →

13. Percent Minority
14. Percent Low-Income

STEP 2 METHODOLOGY - SAFETY CRITERIA

	Metric	How does crossing impact public safety?
Increase Risks	1. Presence of Alternate Grade-Separated Crossings	Emergency responders delayed if no alternate exists. Also, risky driver behavior may rise if better options are not available
	2. Number of Mainline Tracks	Risky driver behavior is more problematic with multiple mainline tracks
	3. Proximity to Emergency Services	Emergency responders may be delayed
Safety Record	4. Collision History	Provides status of current safety history at crossing
Infrastructure Status	5. Level of Protection	Provides level of current safety infrastructure at crossing

STEP 2 METHODOLOGY - MOBILITY CRITERIA

	Metric	How does crossing impact mobility of people and goods/services?
Freight Demand	6. Roadway Freight Classification	Shows freight roadway demand by tonnage
People Demand	7. Vehicle Counts	Shows vehicle demand
Mobility Barrier	8. Gate Down Time	Down time shows traffic delay for non-rail traffic. Down time is based on the train type (unit, freight, passenger) and number of trains.

STEP 2 METHODOLOGY - COMMUNITY CRITERIA

	Metric	How does crossing impact community and economy?
Economic	9. Employment Density	Higher density shows higher economic activity
	10. Proximity to Ports/ Intermodal Facilities	Economic importance if crossing impacts port/intermodal facilities
Activity Area	11. Population Density	Higher density shows higher urban activity
Environment	12. Environmental Risk	(To be determined)
Social Equity	13. Percent Minority	Higher impact if close to minority populations
	14. Percent Low Income	Higher impact if close to low-income populations

STEP 2 METHODOLOGY

How Crossings Will Be Scored
(example for discussion purposes, not a particular crossing)

Description	Criteria	Score (0-100)	Proposed Weight (%)	Final Score (0-100)
Crossing impacts public safety	Safety	75	33%	82
Crossing impacts the mobility of people and goods/services	Mobility	85	33%	
Crossing impacts the community and economy	Community	89	33%	

How should the criteria be weighted?

UPCOMING ADVISORY PANEL MEETINGS

September 28th (10:00am to 4:00pm)

Location: Seatac, Conference Center at Sea-Tac Airport, Beijing Room

TOPIC: Review Draft Prioritized List of Crossings, Discuss Tool Sustainability

November 2nd (10:00am to 3:00pm)

Location: Olympia, John A. Cherberg Building Room ABC

TOPIC: Review Draft Final Report

MORE INFO

<http://leg.wa.gov/JTC/Pages/Road-Rail-Study.aspx>

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STEP 1 METHODOLOGY

SCORING AND FILTERING EXAMPLE

VEHICLE VOLUMES *Average Cars / Day*

1. CALCULATE VALUES

	<u>2015</u>	<u>2035</u>
2015	5,000	9,000

2. APPLY SCORE

2015	1	2
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1 = < 8,000 cars/day
2 = > 8,000 cars/day

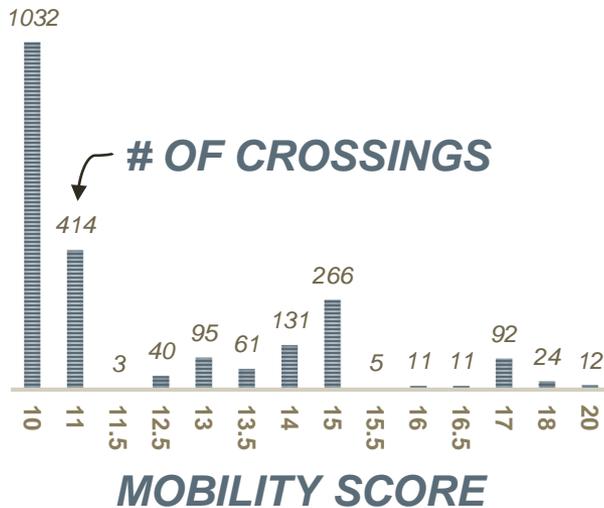
3. SCORE GROUP



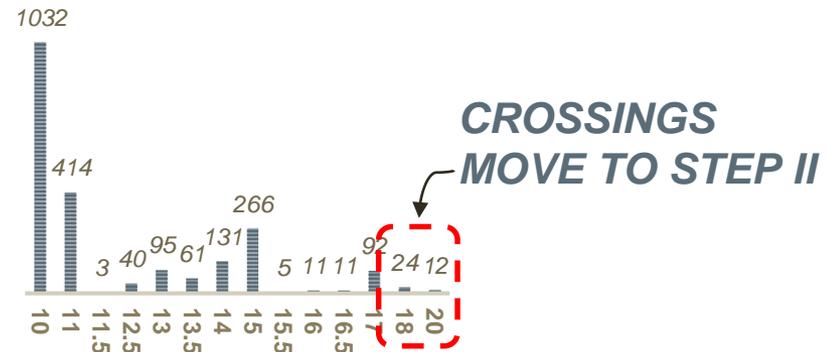
STEP 1 METHODOLOGY

MOBILITY SCREENING EXAMPLE

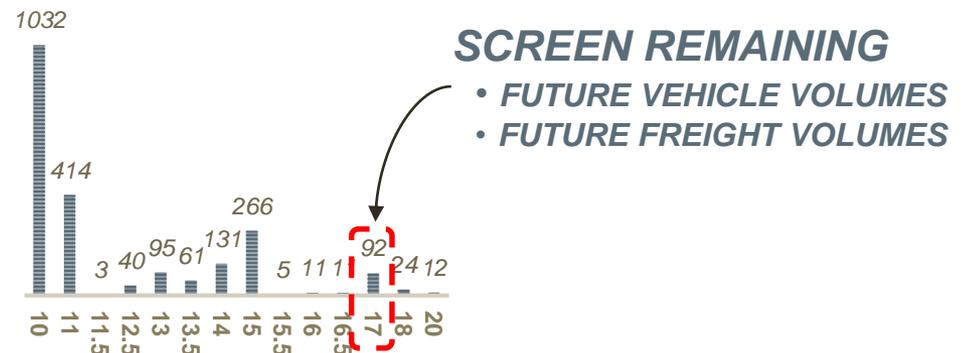
1. REVIEW DISTRIBUTION



2. SELECT HIGHEST TIERS (based on logical break points)



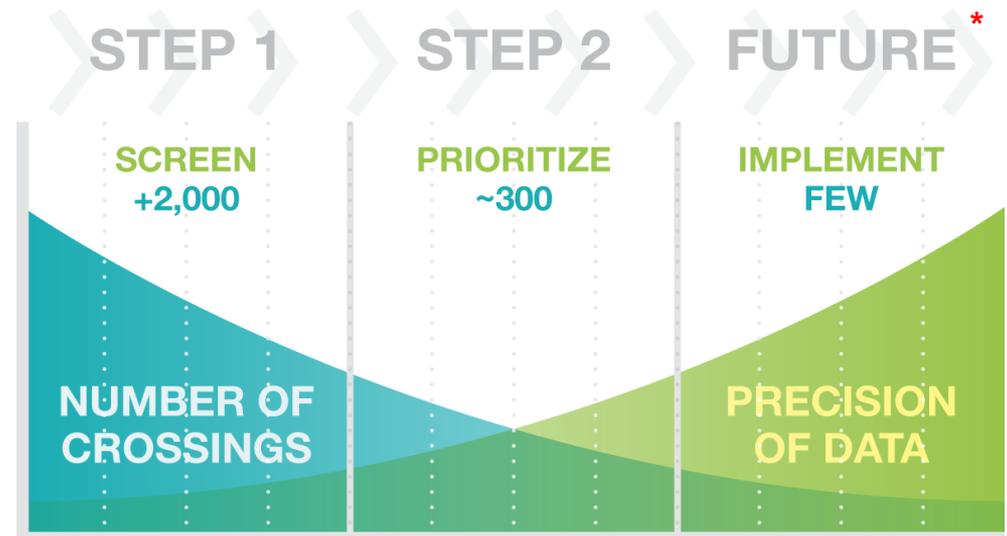
3. SCREEN ADDITIONAL CROSSINGS



OVERVIEW OF THE PRIORITIZATION PROCESS

Why is it Necessary to Prioritize in Steps?

- Objective of this effort is to identify the most “prominent road-rail conflicts” in the state
- Steps allow us to allocate resources effectively
- As number of crossings are reduced, we are able to apply more refined data to compare and contrast
- Future implementation step may take into account other specific intangibles such as timing, partnerships, costs, etc.



**Not part of this study effort*

OVERVIEW OF THE PRIORITIZATION PROCESS

Crossings are screened and evaluated using **three common criteria:**

Safety

Crossing impacts public safety

Mobility

Crossing impacts the mobility of people and goods/services

Community

Crossing impacts the community and economy

